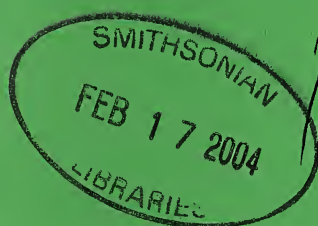


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NOTES ON A VISIT TO PAKISTAN

by Philip Schofield

I visited Pakistan from June 22nd-August 10th 1978, as a voluntary worker with the World Pheasant Association project to reintroduce the Cheer Pheasant *Catreus wallichii* to the Margalla Hills, and I am indebted to the WPA for introducing me to this fascinating part of the world. It was intended that I should assist with the rearing and release of Cheer Pheasant poults raised from eggs sent by UK aviculturists, and attempt to survey the bird life of the release site, with particular reference to potential predators. This led to the division of my time between the rearing station at Bansra Gali in the Murree Hills (2,300m (approx. 7,500ft) above sea level, some 50km (approx. 30 miles) north of Islamabad) and the release site in the Dhok Jiwan basin of the Margalla Hills, which border the north side of the capital (500m (approx. 1,650ft) above sea level). Severinghaus et al. (1979) described this early phase of the project in detail and their coverage continued elsewhere. This article is a belated attempt to record my impressions of Pakistan and its wildlife.

At the time of my visit, much of the area around the release site consisted of scrub up to about 2m (approx. 6 ft or so) in height. This vegetation was developing following the exclusion of domestic livestock, which had apparently grazed the area until there was just dust. However, the release pen itself was sited in a valley along a stream bed, where some taller trees had survived. The area was very rocky and much hard labour was involved in fixing uprights for the pen. As it was the end of the dry season, with the rainy (monsoon) period just beginning, the stream was reduced to a trickle, with an occasional pool, one of which was included in the pheasant enclosure. The Murree Hills surrounding Bansra Gali were largely covered in mature forest, with scattered terraced cultivation. Murree is a holiday destination and refuge from the summer heat of the plains. One of the hill stations once favoured as a hot weather retreat by the British Raj, it retains much of the architecture of the period.

Two of the world's faunal regions, the Palearctic and the Oriental, meet in Pakistan. There is a blend of the familiar and the exotic, where sparrows and sunbirds are close neighbours. At the time there was no field guide to the Indian subcontinent, so the recently published *A Field Guide to the Birds of South-East Asia* (Collins, 1975) had to suffice, supplemented by Ali's and Whistler's classic works. This combination of a modern field guide format with the older combination of text and a few plates made identification difficult at times, and I am sure many species went unrecognised, the vultures being especially confusing.

The attitudes of local people to wildlife came as something of a culture shock. I was with two wildlife conservation officials in the Murree Hills one day, when one of them dived on a small snake, killed it with his penknife and flung it aside without comment. On reflection, I had come from a country with only three species of snake, of which one is mildly venomous, to a land where deadly kraits and cobras occur, and any snake is viewed with suspicion and killed. Should I ever return to Pakistan, I will take with me a reptile book. As it is, I am still not entirely sure whether the two large snakes (some metres (feet) in length) that were either fighting or mating (but made off in opposite directions when I almost stumbled upon them) on a path in the Margalla Hills were cobras or not! Travelling by bus through Islamabad, I saw an apparent Banded Krait *Bungarus fasciatus*, dead, on the end of a stick being flicked into the river. Other reptiles noted were agamid lizards (blamed for raiding strawberry beds) on the outside walls of houses in the Murree Hills, and a soft-shelled turtle in a concrete pond at the small zoo at the foot of the Margalla Hills, the turtle presumably having not arrived unaided. Frogs of every size made a lot of noise in the evenings, especially in wet weather, but again I was not in a position to identify them, nor could I put a name to more than a few of the large and colourful butterflies that came to drink at the pool in the release pen. Hornet-sized yellow wasps were said to be very poisonous, and I gave them a wide berth. Less fortunate was an unidentified scorpion-like creature found on the floor of my resthouse bathroom at Dhok Jiwan, which I am afraid I gave the same treatment as that given by locals to snakes.

Before dealing with the birds, brief reference to mammals may be of interest. On the edge of Islamabad, domestic buffaloes wandered at will. I tried to keep well away from them, a friend having been attacked by one in Turkey. I was threatened only once, by a tethered (fortunately for me) buffalo cow in a farmyard, whose owner was showing me her calf. I was told that a Chinkara Gazelle *Gazelle bennettii* in the zoo had been killed recently by a wild Leopard *Panthera pardus*; these cats were apparently common in the area and a badly stuffed one was displayed on a pole in a suburban front garden. The hauntingly beautiful howling of jackals was heard every evening at dusk, but they never showed themselves. I saw a mongoose and, although a lot of Rhesus Monkeys *Macaca mulatta* had been seen earlier in the year, they must have moved on, as I only ever saw one. A pair of muntjac came to one of the valley's pools to drink in the evenings. The shed quills of porcupines were occasionally found.

The municipal zoo on the outskirts of Islamabad held a selection of local wildlife. Hoofstock housed in a series of barbed wire paddocks comprised Chinkara Gazelle, which had bred, Hog Deer *Axis porcinus*, a male Nilghai *Boselaphus tragocamelus* and a female Urial *Ova vignei* (the wild Red Sheep

of the hills) with the latter's daughter fathered by a domestic ram. A pair of Lion *Panthera leo* cubs had recently been returned to Lahore Zoo (with which there seemed to be frequent exchanges of stock), having outgrown their accommodation and become expensive to feed. Their place had been taken by a Himalayan Black Bear *Selenarctos thibetanus* cub, whose cage label had its name in Urdu and English, which in the latter case read 'Himalayan Black Bear'. When this mistake was pointed out to the management, in this Islamic alcohol-free country, they seemed to find it as funny as I did. When I commented on the bear cub's lack of bedding and suggested it might like some straw on the concrete floor, the reply was: "...is a wild animal, doesn't need any". A series of small enclosures held porcupines, rabbits and guinea pigs, while several Rhesus Monkeys were tethered or held individually in what looked like secondhand laboratory cages. A series of cages, raised off the ground and each about 1.5m (approx. 5ft) in length, held a battered Shikra *Accipiter badius*, a Mottled Wood Owl *Strix ocellata*, a group of Common Quail *Coturnix coturnix* and a dozen (12) or so each of assorted parakeets (an Alexandrine *Psittacula euphratica*, Ring-necked *P. krameri* and Blossom-headed *P. cyanocephala*) and doves (Red Turtle *Streptopelia tranquebarica*, Barbary *S. risoria* dom., Collared *S. decaocto* and Laughing *S. senegalensis*) respectively. A range of aviaries, each some 15m long x 3 m wide x 3m high (approx. 50ft long x 9 ft 9in wide x 9ft 9in high), housed White-crested Kalij *Lophura leucomelanos hamiltoni*, Cheer Pheasant, Himalayan Monal *Lophophorus impejanus*, peafowl *Pavo* sp., cranes (two Demoiselle *Anthropoides virgo* and a Common *Grus grus*), a flock of domestic pigeons and a group of Black Francolins *Francolinus francolinus*. The pheasants had been donated by the Pheasant Trust some years previously. All these birds appeared to be in good condition in their unplanted accommodation, but except for the domestic forms, none of them were breeding. Food for many of the zoo animals, including the birds, seemed to consist largely of roasted gram (chick peas).

Other captive birds seen included two pairs of Grey Francolins *F. pondicerianus*. These lived in a large wire cage on the upstairs landing of the home of a wildlife official with whom I stayed, and had apparently been caught using a trained female Goshawk *Accipiter gentilis* (a *baz* in local terminology), and did not seem to have been injured by this method of capture. Their morning chorus outside the bedroom door removed the need for an alarm clock. An Islamabad bird shop had a large stock of small wild-type budgerigars, breeding in their overcrowded quarters. To my eyes they appeared much more attractive than the exhibition birds that dominate UK stocks. Nearly as numerous were apparently locally caught Red Avadavats *Amandava amandava*, Spotted Munias *Lonchura punctulata* and Silverbills *L. malabarica*. The only other birds in the shop were a few black domestic

ducks, obviously of Mallard *Anas platyrhynchos* origin and only slightly larger in size. Domed wicker partridge cages were on sale here and elsewhere in the bazaars. It seemed to be a common practice to catch chicks of the Grey species (*chitta titar*) and the Black (*kala titar*) (which were called partridges and never referred to as francolins) and rear them as house pets, perhaps also for fighting, as described by Ezra (1934). Prices asked for the birds made the seedeaters relatively cheap, though not in terms of local wages, with budgerigars described to me as “very expensive parrots”.

A visit to Rawal Lake late one evening was disappointing, despite producing the only Night Heron *Nycticorax nycticorax* and Pied Kingfisher *Ceryle rudis* of the trip. (There appeared to be an absence of waterfowl, for apart from the odd Moorhen *Gallinula chloropus*, the only waterfowl I saw during the whole trip were two small flocks of Mallard-descended domestic ducks). The Common Kingfisher *Alcedo atthis* was seen beside a river outside Islamabad and the spectacular White-breasted species *Halcyon smyrnensis* was encountered most days in lowland scrub away from water. White-eyed Buzzards *Butastur teesa* were among the birds seen daily in the Margalla Hills, and were found in fewer numbers around Murree. A worker at the rearing centre had rescued one from drowning in a water tank and was keeping the bird in a fruit crate, in the hope that he could sell the bird to a falconer. I secured its release on the grounds that it was not suitable for falconry, and would not survive for long in that accommodation, on the scraps he was feeding it.

Kalij Pheasants had been seen earlier in the year in the Dhok Jiwan area and were probably still present when I was there. Despite many hours watching the pools for birds coming to drink though, I never saw one; the most certain way to see them is to flush them with dogs, which I was not in a position to do and would not have been appropriate in the breeding season. Grey Francolins were common, and I met a brood of very small chicks crossing a road, whose parents must have been nearby. Black Francolins were even more in evidence, the males challenging each other from dawn to dusk. Laughing and Collared Doves were commonly seen and the Spotted Dove *S. chinensis* was seen occasionally. Ring-necked Parakeets were usually within earshot, even in town. I had not lived alongside Ring-necked Parakeets in England, and the novelty of seeing wild parrots never wore off. Small flocks of Blossom-headed Parakeets were seen occasionally both outside Islamabad and in the foothills. Around Murree their place was taken by the Slaty-headed Parakeet *P. himalayana*, which was seen in groups of fewer than a dozen (12), usually feeding high in the trees.

The sounds of Ring-necked Parakeets are heard in the background of many of the wildlife television programmes filmed in the Indian sub-continent. I also now recognise such calls as the “did-he-do-it” of the Red-

wattled Lapwing *Vanellus indicus* and the duetting of the Rusty-cheeked Scimitar Babbler *Pomatorhinus erythrogenys*. Both were frequently heard at the base of the Margalla Hills, the lapwing around scattered puddles and areas of bare ground, and the babbler in thick scrub. It seems that each of a pair of babblers utters part of what sounds like the several-syllabled call of a single bird. This may enable the two birds to maintain contact in dense vegetation.

I had expected to see some of the small seedeaters in numbers, but this did not happen, partly perhaps because they were not in flocks at that time of the year, but mainly because I did not visit any grain fields or grassland areas. I therefore missed out on Avadavats and Silverbills, apart from those in the bird shop. However, I came across Spotted Munias twice just outside Islamabad, two birds on each occasion, in roadside bushes. Both times they were located by their distinctive double-note, and allowed me to approach within a couple of metres (yards) of them, before they flew off. A farmyard near Islamabad (the one with the buffalo cow referred to earlier) had a lot of weavers' nests in a tree. They had been built by Streaked Weavers *Ploceus manyar*, a few of which were still about though their breeding season seemed to have finished. I was given some of the retort-shaped nests, which are still in good condition. Apparently they are used by the villagers as pot scourers. The ones I brought back had pea-sized lumps of clay in the nest compartment, as described by Ali (1941). Running around the farmyard were a 'gamey-looking' cockerel and a few hens, which the farmer described as *asil* (i.e. noble, pure-bred). While not exactly like the breed known in the West as Aseel, they were tall, 'reachy' and broad-breasted, very much a traditional fighting bird in appearance.

Throughout my stay, a tall *Albezia* tree beside the release pen was the daily song post of a male Orange-headed Ground Thrush *Zoothera citrina*, while Golden Orioles *Oriolus oriolus* were usually to be heard, and sometimes seen, nearby. A white ribbon floating and waving about against a background of dark foliage or rocks would resolve itself through the binoculars into a male Paradise-Flycatcher *Terpsiphone paradisi*. The brown females were less obvious. Common Mynahs *Acridotheres tristis*, with a few Brahminy Starlings *Sturnus pagodarum*, were a daily sight, often amongst short grass of roadside verges in town, like Common Starlings *S. vulgaris* at home. Common Mynahs were nesting under the eaves of a building at Bansra Gali, while Bank Mynahs *A. ginginianus* were observed at the roadside when I was travelling by bus between Islamabad and Murree.

From the limited identification aids available, I confidently identified Olive-backed Pipits *Anthus hodgsoni* in the Margalla Hills. My relevant field notes have got lost in the intervening years, which is unfortunate, as this pre-dated the first published record for Pakistan (Barker et al. 1999).

Without the descriptions of the birds I saw, I cannot submit my record of the species to an appropriate ornithological publication. A definite 'first' for Pakistan was the Indian Pitta *Pitta brachyura*. These had been identified earlier in the year, and single birds were observed several times flying the length of the Dhok Jiwan valley, the blue on the wings being the most striking feature when seen from the road above. Most of the time the pittas stayed hidden, a loud whistle the only indication of their presence.

The rainy season was just beginning. Atmospheric pressure would build up over a couple of days, until the atmosphere felt 'heavy' and people became irritable with each other (The daytime fast practised by Muslims during the holy month of Ramadan did not help). Suddenly there would be a torrential downpour, it was my first encounter with tropical rainstorms. When the rain stopped people would be smiling at each other and birds would appear everywhere. Minivets were particularly active at such times, small flocks of them hawking insects through the open areas of scrub often in company with bee-eaters.

The forested setting of Murree produced some particularly rewarding birding in the early mornings. I saw my first Yellow-billed Blue Pie *Urocissa flavirostris* in an apple tree outside the resthouse in which I was staying, before the bird flew off with its long tail floating behind. This and the formerly aviculturally common Red-billed species *U. erythrorhyncha* are stunning when seen in flight. Of the various flycatchers, the Verditer *Eumyias (Muscicapa) thalassina* was another garden bird. Out in the woods, I met with groups of Russet Sparrows *Passer rutilans* and Himalayan Greenfinches *Carduelis spinoides*, and single examples of the noisy Greater Himalayan Barbet *Megalaima virens*.

It was disappointing not to see any wild pheasants, one of my main objectives in going to Asia, but I will just have to try again when circumstances permit. Enduring memories remain of the unexpected brilliance of shrikes and minivets, combined with an awareness of the many small warblers that I never really got to grips with.

List of 110 species seen in Pakistan 22.6.1978 - 10.8.1978

Abbreviations:	DJ = Dhok Jiwan	MH = Margalla Hills
	I = Islamabad	RL = Rawal Lake
	M = Murree	

Cattle Egret *Bubulcus ibis* (I, MH)

Night Heron *Nycticorax nycticorax* (RL)

Honey-Buzzard *Pernis apivorus* (I, MH)

Black-winged Kite *Elanus caeruleus* (I, MH)

- Black Kite *Milvus migrans* (I, MH)
 White-backed Vulture *Gyps bengalensis* (I, MH)
 Himalayan Griffon Vulture *Gyps himalayensis* (M)
 Shrikra *Accipiter badius* (M)
 White-eyed Buzzard *Butastur teesa* (I, MH, M)
 Common Buzzard *Buteo buteo* (I, MH)
 Long-legged Buzzard *Buteo rufinus* (I, MH)
 Tawny Eagle *Aquila rapax* (I, MH)
 Laggar Falcon *Falco jugger* (I, MH)
 Kestrel *Falco tinnunculus* (I, MH)
 Red-footed Falcon *Falco vespertinus* (I, MH)
 Black Francolin/Partridge *Francolinus francolinus* (I, MH)
 Grey Francolin/Partridge *Francolinus pondicerianus* (I, MH)
 Moorhen *Gallinula chloropus* (RL)
 Red-wattled Lapwing *Vanellus indicus* (I, MH)
 Rock Pigeon *Columba livia* (I, MH)
 Spotted Dove *Streptopelia chinensis* (I, MH)
 Collared Dove *Streptopelia decaocto* (I, MH)
 Laughing Dove *Streptopelia senegalensis* (I, MH)
 Slaty-headed Parakeet *Psittacula himalayana* (M)
 Ring-necked Parakeet *Psittacula krameri* (I, MH)
 Blossom-headed Parakeet *Psittacula cyanocephala* (I, MH)
 Pied Crested Cuckoo *Clamator jacobinus* (I, MH)
 Plaintive Cuckoo *Cacomantis merulinus* (I, MH)
 Common Hawk Cuckoo (Brainfever Bird) *Hierococcyx varius* (I, MH)
 Koel *Eudynamis scolopacea* (I, MH)
 Sirkeer Malkoha/Cuckoo *Phaenicophaeus leschenaultii* (I, MH)
 Common Coucal *Centropus sinensis* (I, MH)
 Himalayan Barred Owlet *Glaucidium cuculoides* (M)
 Mottled Wood Owl *Strix ocellata* (I, MH)
 Franklin's Nightjar *Caprimulgus affinis* (I, MH)
 Eurasian Nightjar *Caprimulgus europaeus* (I, MH)
 Jungle Nightjar *Caprimulgus indicus* (I, MH)
 House Swift *Apus affinis* (I, MH)
 Alpine Swift *Tachymarptis melba* (I, MH)
 Pied Kingfisher *Ceryle rudis* (RL)
 Common Kingfisher *Alcedo atthis* (I)
 White-breasted Kingfisher *Halcyon smyrnensis* (I, MH)
 Little Green Bee-eater *Merops orientalis* (I, MH)
 Indian Roller *Coracias benghalensis* (M)
 Hoopoe *Upupa epops* (I, MH)
 Great Himalayan Barbet *Megalaima virens* (M)

- Black-rumped Flameback (Woodpecker) *Dinopium benghalense* (M)
 Brown-fronted Pied Woodpecker *Dendrocopos auriceps* (M)
 Indian Pita *Pitta brachyura* (DJ)
 Crested Lark *Galerida cristata* (I, MH)
 Red-rumped Swallow *Hirundo daurica* (I, MH)
 Wire-tailed Swallow *Hirundo smithii* (I, MH)
 Olive-backed Pipit *Anthus hodgsoni* (I, MH)
 Long-billed Pipit *Anthus similis* (I, MH)
 Short-billed Minivet *Pericrocotus brevirostris* (M)
 Small Minivet *Pericrocotus cinnamomeus* (I, MH)
 Red-vented Bulbul *Pycnonotus cafer* (I, MH)
 White-cheeked Bulbul *Pycnonotus leucogenys* (I, MH)
 Black Bulbul *Hypsipetes madagascariensis* (M)
 Rufous-backed Shrike *Lanius schach* (M)
 Bay-backed Shrike *Lanius vittatus* (I, MH)
 Blue-fronted Redstart *Phoenicurus frontalis* (M)
 Pied Bushchat *Saxicola caprata* (I, M)
 Grey Bushchat *Saxicola ferrea* (M)
 Indian Robin *Saxicoloides fulicata* (I, MH)
 Blue-headed Rock Thrush *Monticola cinclorhynchus* (MH)
 Orange-headed Ground Thrush *Zoothera citrina* (DJ)
 Plain-backed Mountain Thrush *Zoothera mollissima* (M)
 Grey-winged Blackbird *Turdus boulboul* (M)
 Tickell's Thrush *Turdus unicolor* (M)
 Rusty-cheeked Scimitar Babbler *Pomatorhinus erythrogenys* (MH)
 Black-chinned Babbler *Stachyris pyrrhops* (MH)
 Common Babbler *Turdoides caudatus* (I, MH)
 Jungle Babbler *Turdoides striatus* (I, MH)
 Streaked Laughingthrush *Garrulax lineatus* (M)
 Eastern Crowned Warbler *Phylloscopus coronatus* (I, MH)
 Grey-headed Flycatcher Warbler/Grey-hooded Warbler *Seicercus xanthoschistos* (M)
 Brown Hill Warbler/Striated Prinia *Prinia criniger* (I, MH)
 Franklin's Wren-Warbler/Grey-breasted Prinia *Prinia hodgsonii* (I, MH)
 Greater Brown Wren-Warbler/Plain Prinia *Prinia inornata* (I, MH)
 Fan-tailed Warbler/Zitting Cisticola *Cisticola juncidis* (I, MH)
 Common Tailorbird *Orthotomus sutorius* (I, MH)
 Little Pied Flycatcher *Ficedula westermanni* (M)
 Sooty/Dark-sided Flycatcher *Muscicapa sibirica* (M)
 Verditer Flycatcher *Eumyias (Muscicapa) thalassina* (M)
 Grey-headed Canary Flycatcher *Culicicapa ceylonensis* (M)
 White-throated Fantail (-Flycatcher) *Rhipidura albicollis* (M)

Asian Paradise-Flycatcher *Terpsiphone paradisi* (MH)
 Grey Tit *Parus major* (I, MH)
 Chestnut-bellied Nuthatch *Sitta castanea* (M)
 Purple Sunbird *Nectarinia asiatica* (I, MH)
 Oriental White-eye *Zosterops palpebrosa* (I, MH)
 Crested Bunting *Melophus lathamii* (M)
 Himalayan Greenfinch *Carduelis spinoides* (M)
 Spotted Munia *Lonchura punctulata* (I, MH)
 House Sparrow *Passer domesticus* (I, MH)
 Russet Sparrow *Passer rutilans* (M)
 Streaked Weaver *Ploceus manyar* (I (village setting))
 Brahminy Starling/Mynah *Sturnus pagodarum* (I, MH)
 Bank Mynah *Acridotheres ginginianus* (M)
 Common Mynah *Acridotheres tristis* (I, MH)
 Golden Oriole *Oriolus oriolus* (MH)
 Black Drongo *Dicrurus macrocerus (adsimilis)* (I, MH)
 Ashy Drongo *Dicrurus leucophaeus* (I, MH)
 Black-throated/Lanceolated Jay *Garrulus lanceolatus* (M)
 Yellow-billed Blue Magpie *Urocissa flavirostris* (M)
 Indian/Rufous Treepie *Dendrocitta vagabunda* (I, MH)
 Raven *Corvus corax* (M)
 Jungle Crow *Corvus macrorhynchos* (M)
 House Crow *Corvus splendens* (I, MH)

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CAPTIVE BREEDING OF THE WHITE-BELLIED BUSTARD *Eupodotis senegalensis* AT JACKSONVILLE ZOOLOGICAL GARDENS

by Allison S. Cox

Abstract

August 1999-October 2002, 11 White-bellied Bustards *Eupodotis senegalensis* were hatched at Jacksonville Zoological Gardens, Florida, USA. The mortality rate of chicks within the first 160 days was 45%. Inadequate parental care contributed to three of the five deaths. Nutritional bone disease was suspected in the other two cases of mortality. Musculoskeletal disorders were seen in 100% of chicks that lived over 30 days. Parental neglect stemmed from chick favouritism and dietary factors related to calcium metabolism were identified as risk factors in the successful propagation of these birds.

Introduction

The White-bellied Bustard is a medium-sized, buff-coloured, terrestrial species usually found in grasslands of central and southern Africa (Bailey et al. 1996a; Collar, 1996). It is sexually dimorphic with the males being slightly larger and having a black crown and throat (Collar, 1996). The precocial chicks are covered in pale down with dark stripes and can stand within hours of hatching (Bailey et al. 1997). In the wild, they are omnivorous and their diet includes insects, snails, lizards, seeds, berries and flowers (Collar, 1996).

History and exhibits

Jacksonville Zoological Gardens (JZG) received a male White-bellied Bustard in 1999 to be paired with a female already in the collection. August 1999-June 2002, this pair produced eight chicks. In 2002, this pair's first offspring 'Tank' mated with an unrelated female, 'Amelia', and sired three chicks.

Pair 1. Our original pair is housed in the Rift Valley Aviary. This is approximately 18m long x 12m wide x 6m high (60ft long x 40ft wide x 20ft high) and has a 3m long x 3.5m wide x 3m high (approx. 10ft long x 12ft wide x 10ft high) 'howdy' pen at one end. The pen has large doors at each side, one side giving access to the aviary and the other opening up to the outside. It is covered in fine ZooMesh™ for added security. The howdy pen has been very useful when introducing birds, separating aggressive and injured birds, and recapturing escapees. It also proved beneficial when the bustards began to breed. When the eggs hatched, the sire, dam and chicks

were immediately moved into the howdy pen, in which keepers were better able to observe and care for them. It also allowed for protection from rodent pests, aggressive aviary companions and curious guests (members of the public), while at the same time eliminating competition for the chicks' food. Having the birds in a confined area also made it easier to catch them so that they could be weighed and undergo medical examinations.

Pair 2. Tank and Amelia were placed together in 2000 but did not show any courtship behaviours until July 2002 when they were moved to the Seronera Bat Exhibit. This domed exhibit is 4.5m (approx. 15ft) tall at the peak. The circular base of the exhibit is 6.4m (approx. 21ft) in diameter. Grass in one section was left uncut to provide cover. The pair had previously been kept in several different enclosures in which the two birds showed no interest in each other. However, within days of being moved into the new exhibit, Tank began to show courtship behaviours, e.g. following Amelia around the exhibit very slowly with his beard extended; he also started feeding her with insects. Less than a month after being moved to the new exhibit, Amelia laid her first egg.

Reproduction and growth

White-bellied Bustards at JZG have laid clutches of one or two eggs between the months of April-August. The nests were shallow depressions in the earth often situated between tall grasses. The incubation period was 17-22 days. The chicks were weighed every three days to monitor their growth. Newly hatched chicks ranged from 30.5g-43.2g, the average weight being 37.7g. Most of the chicks showed similar growth rates (Fig. 1). The chicks were offered insects (mealworms and crickets) three times a day. Twice a day a $\frac{1}{4}$ cup of Mazuri Small Bird Breeder, a $\frac{1}{4}$ cup of finely chopped fruit and 60g of a bird of prey mix was placed in the enclosure. Our fruit mix consisted of 20% each of apple, melon and banana, plus 10% each of kale, squash, grapes and papaya or pear. The bird of prey mix was 80% Nebraska Brand Bird of Prey, 10% Formax Egg Ration Crumbles and 10% Aquamax® Starter Brand Fingerling 300. The chicks were first observed picking up insects on their own at about 15 days old. They were usually weaned by 40 days.

Social interactions

Studies of White-bellied Bustards in the wild have revealed they are monogamous and can be found living in small groups with little aggression within the groups (Mwangi and Karanja, 1989; Collar, 1996). Although group size and sex ratio of our birds have been determined artificially by zoo staff, many of their breeding behaviours mirror those of White-bellied Bustards observed in the wild.

Pair 1. Among bustard genera, *Eupodotis* bustards are the only group wherein the female is not entirely responsible for the rearing of the young (Collar, 1996). With our original breeding pair we found the role of the sire not only important, but essential. The female selected the nest site, incubated the eggs, and defended the eggs and the young. However, it was the sire that seemed to be solely responsible for feeding the chicks. He would pick up insects and take them to the chicks, allowing them to pick these from his beak. When the chicks were sufficiently mobile, the male would pick up insects and with soft purr-like vocalizations call the young to him. After this feeding technique was mastered, he would turn away from the chicks or hold insects higher off the ground, providing challenges to the young birds.

Our dam did not participate in the feeding of the chicks, moreover we discovered that the sire seemed to show favouritism when there was more than one chick to feed. With three of the pairs' five clutches, two chicks hatched (Table I). When this occurred the sire would feed the majority of the food to one chick despite active and vocal begging by the other offspring. Keepers attempted to solve this by removing the dam and one of the chicks to another location, but she still would not feed her young. This usually resulted in the hand-feeding of one of the chicks from each clutch.

White-bellied Bustards in the wild will often allow a young male offspring from a previous clutch to stay and help defend the territory. In bustards, this trait is unique to *Eupodotis* spp. The young male is probably not seen as a threat because as with most bustard species, young male White-bellied Bustards can defer maturity for a year or longer (Collar, 1996). Birds acting as 'helpers' have also been observed here at JZG. Occasionally, older siblings were seen feeding chicks even long after they had been weaned. One bustard in particular was observed routinely taking insects to his two-month old sibling. He would respond to our morning operant conditioning programme in the aviary, pick up a mealworm and take it to the other bird roughly 25ft (approx. 7.6m) across the aviary. During the time the chicks and parents were in the howdy pen, the offspring from the previous clutch was usually left in the aviary, separated from the rest of the family by 12mm (1/2in) mesh chicken wire. This did not prevent the helper birds from participating in the rearing as they would bring items of food from the aviary and feed the hungry chicks through the wire.

At times older siblings were found to be more of a distraction than a help. In May 2001, our pair only had one chick hatch. The chick, parents and juvenile were all moved into the howdy pen. The sire chose to feed the juvenile rather than the chick, so the older sibling was moved into the main aviary. Unfortunately, the sire continued to concentrate primarily on feeding the juvenile through the wire, so the bird was moved to another enclosure on the other side of the zoo. After being removed from the group, the juvenile

started to grow black feathers on the crown and throat, indicating that it was a male. Three months later, keepers attempted to reintroduce the young male back into the group, but the sire aggressively rejected it.

Pair 2. The inexperienced sire, Tank, repeatedly pecked at his first chick as it attempted to hatch and the chick died from its injuries the following morning. A little over a month later, two chicks hatched successfully. Tank had been separated behind a wire fence a few days before they were due to hatch and was reintroduced when the chicks were three days old. The social interactions between the new parents and their chicks were very different from those of our original pair. Both parents fed the chicks equally and showed no favouritism. However, as soon as the chicks could feed on their own they had to be removed to another location due to excessive plucking by the parents.

Morbidity and mortality

August 1999-November 2002, 11 White-bellied Bustards hatched at JZG (see Table 1). Our study focused on the first 160 days of life as previous research determined complete ossification of the long bones and thus skeletal maturity is reached at this age (Naldo et al. 1998). Of the chicks that survived over 30 days, all showed some form of musculoskeletal disorder.

The most common problem was 'dropped wing', an extension of the elbow and carpal joint with an apparent inability to maintain the wing in a flexed position (see photo p.111). This condition was encountered with all seven chicks that lived longer than 30 days. With six of these chicks, the dropped wing was accompanied by an outward rotation of the wing tips. This is commonly referred to as 'angel wing' (Naldo et al. 1998). To correct these abnormalities, the growing primary feathers were pulled out in an attempt to decrease the weight on the joint. If the deformity was more severe, the wings were taped up in the correct position until they began to grow normally (see p. 112). This was an effective treatment protocol and little or no evidence of skeletal deformities were seen in adulthood. In an effort to prevent the heavy primary feathers from growing too early, the amount of protein in the diet was reduced by removing Aquamax® from their pellet diet. We continued to encounter angel wing in subsequent clutches and may further reduce the protein component.

One bird in the study was found to have nutritional bone disease. This was discovered in August 2000 in our second clutch when a 39-day old chick with a dropped wing was found to have a palpable fracture of the left humerus. Radiographs revealed very poor bone mineralization of the long bones, folding fractures of the right humerus and ulna, and recent fractures of the left humerus and ulna. The compound fracture of the left humerus



Ten-day old parent reared White-bellied Bustard chick with 'dropped wing' at JZG.

was so severe that the left wing had to be amputated. To improve bone mineralization in the chicks, we began dusting their food, including insects, with $\frac{1}{4}$ teaspoon of Osteoform. The addition of this was made permanent after which we saw no further evidence of poor bone mineralization until June 2002 when a necropsy examination on a 23-day old chick found unexpected soft and flexible bones. As a result the food will in future be dusted with ground oyster shell, which may be more easily absorbed than Osteoform.

Of the 11 chicks that hatched during the study, five did not survive to



Sixteen-day old parent reared White-bellied Bustard chick with taped wings at JZG.

160 days (see Table 2). The chick that had a wing amputated seemed to be thriving but died spontaneously at 104 days. In 2002, our original pair had another chick die spontaneously and no abnormalities other than poor bone mineralization were found. Inadequate calcium levels are suspected as having contributed to these deaths. One chick from our first clutch in 1999 died at six days old. It was being ignored by its parents and was found away from the family and had mud in one of its eyes, which led to an eye infection. The chick was treated for the infection and fed by hand, but did not survive. Another chick died at seven days of age after getting separated from its parents and becoming cold and muddy, which led to it getting pneumonia. As stated earlier, the first chick to hatch to our second pair, expired after being injured by the sire during hatching.

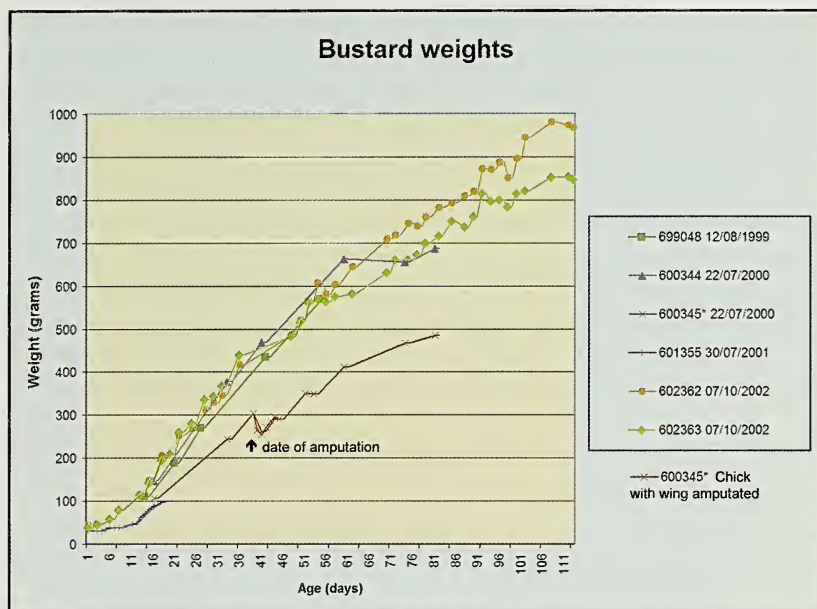


Fig.1. Growth curves of six parent reared White-bellied Bustard chicks hatched at JZG.

Discussion

This study has greatly expanded our knowledge of breeding the White-bellied Bustard in captivity. Most previous research on rearing the chicks of this species in captivity has involved hand-reared birds. In an effort to allow the birds in our collection to raise their own young, it was important for us to observe the social interactions between the chicks and the rest of the family.

Based on these observations, we were able to quickly adjust our husbandry protocol to reduce the likelihood of deaths due to environmental factors following parental neglect. However, the medical issues have been more difficult to overcome. The two most common instances of morbidity in our collection, angel wing and fractures, were also the most prevalent conditions found at the National Avian Research Center (NARC). It reported 83.3% of its White-bellied Bustards showed musculoskeletal disorders and noted that angel wing was more common in the White-bellied Bustard than in the other three bustards in its study (Naldo et al. 1998). All of the musculoskeletal deformities found at JZG were diagnosed within 13 weeks of age. Researchers at NARC noted that long bone growth rates are at their peak during this period of time (Naldo et al. 2000). Nutritional deficiencies, early growth of heavy primaries and high protein diets were all causes of musculoskeletal deformities noted by Bailey et al. (1996b) and Naldo et al.

(1998). It is encouraging to find that the frequency of nutritional bone disease seen in bustards at NARC was reduced after changes were made to calcium and vitamin D₃ levels in the diets (Bailey et al. 1996a; Bailey et al. 1997). Hopefully, with further diet modifications, we will also succeed in decreasing the occurrence of skeletal deformities in our White-bellied Bustards.

Although we continue to face obstacles when rearing White-bellied Bustard chicks, the data collected during the rearing of previous clutches helps us anticipate such difficulties. Keepers are now watchful for signs of musculoskeletal disorders as well as parental behaviours that are not conducive to raising healthy chicks. Early recognition of these problems allows us to react quickly and correct the conditions, until through diet and environmental modifications we can prevent the problems from occurring.

Table 1. Reproduction of White-bellied Bustards at JZG from 1999-2002.

Clutch size	Hatch date	% survival to 30 days	% survival to 160 days
Pair 1	2 12 & 14 August 1999	50	50
	2 22 July 2000	100	50
	1 13 May 2001	100	100
	2 29 & 30 July 2001	50	50
	1 31 May 2002	0	0
Pair 2	1 29 August 2002	0	0
	2 6 October 2002	100	100

Table 2. Causes of mortality of captive-hatched White-bellied Bustard chicks at JZG.

ISIS#	Age at death (days)	Cause of death	Parental factors
699049	6	Eye infection/septicemia	Parental neglect
600345	104	Poor bone mineralization/ amputation of left wing	None
601354	7	Pneumonia	Parental neglect
602356	23	Poor bone mineralization	None
602359	1	Compound fracture of right humerus	Parental injury

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THE CAPTURE OF EIGHT MONTSERRAT ORIOLES AND THEIR SUBSEQUENT ESTABLISHMENT AND BREEDING AT JERSEY ZOO

by Andrew Owen

Introduction

The small island of Montserrat in the eastern Caribbean has experienced volcanic activity from the Soufrière Hills volcano since July 1995. Irregular eruptions, heavy ash falls and pyroclastic flows have caused severe damage to the infrastructure of the island and to much of its remaining forest (Arendt et al. 1999)

The island's only endemic bird species is the Montserrat Oriole *Icterus oberi*, whose primary habitat before 1995 was in the mountain forests and gullies (ghauts) in the south of the island. The majority of this forest has been destroyed by the volcanic activity. Following research undertaken by the Royal Society for the Protection of Birds and staff from the Montserrat Forestry Department, it was found that the oriole still survived in remaining forested areas and that its numbers were still reasonably high, within the region of several thousand birds.

Despite the relatively high number of birds still surviving at the time and the reduced activity from the volcano, the Montserrat Alliance (a working group comprising members of the Montserrat Ministry of Agriculture, Trade and the Environment (MATE), Durrell Wildlife Conservation Trust, Royal Society for the Protection of Birds (RSPB), World Wide Fund for Nature (WWF), Fauna and Flora International (FFI) and The Royal Botanical Gardens, Kew), decided that because of the unpredictable nature of the volcano, it would be prudent to collect from the wild a small number of orioles. Therefore, an expedition was mounted to collect four pairs and establish them at Jersey Zoo, in order to carry out trials into the husbandry and captive breeding requirements of this aviculturally unknown species.

The Montserrat Oriole

The Montserrat Oriole was first described by G. N. Lawrence in 1880 (Jaramillo and Burke, 1999). It was declared the national bird of Montserrat in 1982. It is a member of the family Icteridae, which comprises some 103 species, 49 of which belong to the genus *Icterus*, the New World Orioles.

Description

Adult male, 20cm-22cm (approx. 8in-8½in). The eyes are dark reddish-brown and the bill is black with the base of the lower mandible pale grey. The head, mantle, breast and wings are black. The black breast ends abruptly,



Andrew Owen

Male Monserrat Oriole captured at Woodlands, Centre Hills.



Andrew Owen

Female Monserrat Oriole captured at Blackwood Allen, Centre Hills.

the lower breast and belly to the vent being a rich yellow colour; these feathers being faintly tinged with tawny brown. The lower back, rump and upper tail-coverts are lemon yellow. The tail is black. The legs and feet are bluish grey and the claws are black.

Adult female, 20cm-22cm (approx. 8in-8½in). The eyes, bill, legs and feet are the same colours as those of the male. The crown is yellow-olive, becoming olive on the nape and mantle. The rump is olive with a yellow wash. The lores are black and the face is yellowish with a chestnut wash on the cheeks. The underparts are entirely olive-yellow. The wings are olive-brown. The greater wing-coverts, tertials, secondaries and primaries are edged with tawny. The lesser and median wing-coverts are tipped olive-yellow, and the tail is olive with a yellowish wash.

Distribution and status

The species is sedentary and, prior to 1995, was widely distributed in suitable habitat (moist tropical forest and bamboo forest) across the island's three main interior mountain ranges, the Soufrière Hills, the South Soufrière Hills and the Centre Hills. Since 1995 the oriole and its habitat in the Soufrière and South Soufrière Hills has been lost (Arendt et al. 1999).

The species was previously considered Near Threatened (Collar et al. 1994) but as half to two-thirds of its former range has now been lost, Arendt et al. (1999) recommended that it be classified as Globally Threatened (endangered) due to the loss of breeding habitat since 1995.

Capture and maintenance of orioles on Montserrat **Construction of holding aviaries**

On arrival in Montserrat the first task was to find a suitable site for the establishment of temporary holding cages or aviaries for the birds that were to be trapped. On the advice of ministry personnel, a site was chosen at the Ministry of Agriculture's plant nursery in St Peters. This location offered shade and seclusion for the birds, and was situated relatively close to areas of forest in which the trapping would take place, and was within walking distance of my accommodation.

Two possible sites were available in the plant nursery. The first, a range of low chainlink cages which had been used to house dogs prior to their evacuation from the island, was dismissed immediately as the cages would require a large amount of modification before they would be suitable for accommodating small passerines. Furthermore, the cages were being used by a local farmer to house pigs and chickens and hygiene standards were very poor. Therefore, we chose to build the holding aviaries in a large wooden-framed structure, which was being used for growing local forest plants.

The decision was taken to build eight individual aviaries within the existing structure, as it was not known whether the orioles would behave aggressively towards each other once in captivity. The eight aviaries (3m long x 1.5m wide x 2.5m high (approx. 9ft 9in long x 5ft wide x 8ft 3in high)) were constructed using a timber framework with the walls and roof made from black shade cloth. The latter was chosen because it would give the birds some protection from the intense sunshine and would reduce any interactions between birds in adjacent aviaries. Using this material, rather than wire mesh, also facilitated the quicker construction of the aviaries, which were built within four days.

Access to each aviary was through small interconnecting doors, built into the shade cloth. Thick cover for the birds was provided using cut leafy branches. Plastic trays were attached to each aviary frame for food and water receptacles. The floor substrate was soil and leaf litter.

Capture of Montserrat Orioles

As there were ongoing studies of the Montserrat Oriole taking place along several transects within the forest of the Centre Hills, many of the most suitable areas could not be used for trapping. Therefore, alternative locations were chosen by Forest Department rangers. Mist netting attempts took place at various locations between July 1st-July 10th 1999. These began early in the morning, when the temperature was cooler and the birds were most active. Each of the sites was a known oriole site or an area which appeared to be suitable oriole habitat. These were normally in an area with a number of stands of *Heliconia caribaea* plants, the favoured nest site for this oriole. If located in an area of thick vegetation, a strip approximately 2m-3m (some 6ft 6in-9ft 9in) wide, and the length of the nets, was cleared. Up to four three-shelf mist nets were used, depending on the steepness of the terrain. Each net was 15m (approx. 50ft) in length and attached to aluminium poles and supported by guy strings. The nets were set from ground level to 4m (approx. 13ft) high.

Up to three lines of nets were set in one area to maximize the chances of catching the orioles. Once the nets were set, all personnel sat quietly at one end of the net, and a tape recording of a calling male Montserrat Oriole was played at intervals in an attempt to attract orioles defending territories in the vicinity into the nets. The forest rangers also imitated calling orioles.

During the mist netting procedure a number of other bird species were inadvertently caught. These were photographed and released. If after one to two hours there were no signs of orioles in the area, one of the rangers searched for a more suitable area. If such an area was located, the nets were closed and moved to the new area. No more than two orioles were caught on any one day. During 10 full days of mist netting (approximately nine hours per day), on three days no orioles were caught.

Table 1. Birds caught during mist netting.

Bridled Quail-Dove <i>Geotrygon mystacea</i>	3
Antillean Crested Hummingbird <i>Orthorhyncus cristatus</i>	3
Purple-throated Carib <i>Eulampis jugularis</i>	5
Pearly-eyed Thrasher <i>Margarops fuscatus</i>	12
Scaly-breasted Thrasher <i>Allenia fuscus</i>	1
Forest Thrush <i>Cichlherminia lherminieri</i>	8
Bananaquit <i>Coereba flaveola</i>	5
Montserrat Oriole <i>Icterus oberi</i>	8

Establishment in the holding aviaries

Upon being caught, each oriole was ringed with a coloured split plastic ring, and the skull, bill, tarsus, wing and tail measured using adjustable callipers. The bird was then placed in a cloth bag and weighed using a Pesola 300g spring balance, accurate to 2g. The bag with the bird inside was then placed in a shady area and mist netting continued. If, after an hour, no further orioles were located or caught, the nets were closed and the captured bird or birds taken to the holding aviaries and given a brief examination before being released into an aviary. The orioles were kept in pairs, one pair in each of four of the eight aviaries. Close observation was kept on each pair to ensure no aggression occurred.

Water for drinking and bathing was provided in shallow dishes. Food was provided in a number of receptacles, shallow ceramic saucers and plastic D-pots at various locations around the aviaries, to ensure that the birds had no difficulty finding food and that individual birds would not dominate favoured feeding stations. Although several authors and observers had stated that the Montserrat Oriole feeds almost exclusively on insects and other invertebrates (Arendt and Arendt, 1984; Raffaele et al. 1998; Jaramillo and Burke, 1999), I decided to offer the captive birds as varied a diet as possible in order to encourage them to feed. A variety of proprietary brands of dry insectivorous mixtures were offered: Witte Molen Low Iron, Universal and High Insect, as well as Witte Molen Low Iron Mynah pellets which had first been soaked in water. Although little or no fruit is thought to be taken by Montserrat Orioles in the wild, to the dishes of dry insectivorous food, I added finely diced apple, grape and banana, and large slices of mango or papaya were spiked on branches in the aviaries. Small mealworms, house crickets and waxmoth larvae brought from Jersey were offered in the food dishes. All insects offered, as well as mango and papaya, were readily taken by the birds. Little or none of the proprietary brands of insectivorous food was taken during the holding period.

The birds were fed and watered early each morning, usually at 6.00am prior to further mist netting in the forest. They were checked at midday and

*Andrew Owen***One of eight holding aviaries in Montserrat.**

again late in the afternoon, when they were given a second insect feed. During the midday check, the aviaries were given a thorough soaking using a hose pipe. This helped the cut branches retain their leaves and seemed to be appreciated by the birds, which bathed in the freshly replenished water dishes.

Whenever the aviaries were approached or entered the orioles became nervous and flew from end to end, or attempted to hide amongst the foliage. When observed from a distance they remained calm, and were seen feeding, bathing or sitting quietly in amongst the foliage. No interactions were seen between birds sharing aviaries or in adjoining aviaries.

Transportation from Montserrat to Jersey

Once all eight orioles were caught and established in the holding aviaries, there was some urgency to transport them to Jersey Zoo as soon as possible as food supplies, particularly of insects, were running low. Following health clearance by the local veterinarian and the completion of all permits and transportation arrangements, the birds were caught on July 13th 1999 and placed in two wooden travelling crates 77cm wide x 30cm deep x 25cm high (approx. 2ft 6in wide x 1ft deep x 10in high). These were divided into four compartments per crate, each 19cm x 30cm x 25cm (approx. 7½in x 11¾in x 9¾in). One bird was placed in each compartment, and provided with food and water in small plastic drinking tubes.

Once crated, the orioles (and nine Mountain Chicken Frogs *Leptodactylus fallax* also collected on the trip) were transported by road the short distance to the island's helipad. From there they were flown to Antigua, where they were inspected and given clearance by the Ministry of Agriculture's Chief Veterinary Officer. They remained there for 11 hours awaiting the connecting flight to London, during which time I was able to visit them regularly to ensure they remained fit and well.

They were flown to Gatwick Airport and then travelled by road to Heathrow Airport, finally arriving in Jersey on July 14th after spending over 30 hours boxed and in transit.

Establishment in Jersey

Housing and husbandry

On arrival at Jersey Zoo, the birds were taken to the zoo's quarantine facility. There they were removed from their travelling crates and given a brief physical examination by the zoo veterinarian. All eight birds appeared to be in good physical condition. The orioles were then placed in small indoor aviaries in the quarantine facility. Each aviary measured 2m long x 2m high x 1m wide (approx. 6ft 6in long x 6ft 6in high x 3ft 3in wide). The birds were kept in the same pair combinations as they had been in the holding facility in Montserrat.

Each aviary was furnished with a variety of branches for perching and cut leafy branches of Holm Oak *Quercus ilex* to provide cover amongst which the birds could hide. They were checked and fed three times a day, when in addition to the diet they were given in Montserrat, they were offered a shallow dish containing the same softbill mixture as that offered to all the zoo's insectivorous and omnivorous softbills. This is a mixture of Witte Molen Low Iron, High Insect and Universal feeds, finely grated carrot, wholemeal bread, hard-boiled egg and soaked Witte Molen Low Iron Mynah pellets. The complete mixture is dusted with Nutrobal multivitamin powder. A shallow dish of water was provided for drinking and bathing.

The quarantine building was kept at a minimum temperature of 20°C (68°F) and was fitted with a timer clock to provide the birds with 12 hours of light. The latter was in addition to natural daylight provided by windows along one side of the building.

Health

Whilst in isolation the orioles completed a mandatory quarantine period of 45 days. During this period they underwent regular faecal examinations for bacteriology, parasitology and Chlamydia testing. Bacteriology and parasitology tests revealed a number of parasites or their ova in all individuals. Cestodes were treated using the injectable drug Droncit. Nematodes, Histomonas and flagellates were treated using the three-day course of 10% Panacur, administered by injecting the drug into waxmoth larvae, a favourite food item. Samples taken for Chlamydia testing from two individuals, initially proved positive. However, a second sample was tested before any treatment was administered, and this was negative. Some concerns were expressed over the sensitivity of the method of Chlamydia testing, and, despite the negative result, these individuals completed a 45-day course of Aureomycin (2.5g administered ad libitum in 1 litre of drinking water), after which a third test again proved negative.

As the end of the quarantine period coincided with the onset of winter in Jersey, it was decided to maintain the orioles in these warm conditions until the following spring. One pair though was moved to an annexe, where the birds had a warm indoor building, but also had the option of using an attached outdoor planted aviary. This gave us the opportunity to undertake research (Williams, 2000) and also acclimatise this pair, which continued to use the outdoor aviary during fine weather, although the pair remained inside during very cold or wet spells and always roosted inside.

Breeding

All eight birds adapted to life in captivity remarkably well and have since bred. Six young were reared in the first year (2000), eight in 2001, 10 in 2002 and seven this year (2003). Two pairs of Jersey bred birds were sent to London Zoo, which subsequently lost a male and will be getting another male. Pairs have also been sent to Edinburgh Zoo and Chester Zoo. To date the species has bred only at Jersey Zoo.

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companionship in the field; without their help and hard work the success of this trip would not have been possible. Many thanks to DFID 'Mr Fix-it' Tony Hill for all his help in logistics, sorting out vet visits, permits, flight arrangements and generally smoothing the way whenever possible. Thanks to Eluned Price and Anna Feistner for their suggestions, encouragement and gentle persuasion during the writing of this paper. Thanks to Geoff Hilton, RSPB, who provided the figures.

Products mentioned in the text

Pesola spring balance: Pesola AG, Rebmattli 19, CH-6340 Baar, Switzerland.

Witte Molen Universal Food, High Insect Food, Low Iron Mix, Low Iron Mynah Pellets: Witte Molen BV, Moleneind 2, 4268 GD, Meeuwen, The Netherlands.

Nutrobal multivitamin powder: Vetark Animal Health, P.O. Box 60, Winchester, Hampshire SO23 9XN, UK.

Plastic coloured split rings: Lambournes Bird Rings Ltd., Ryelands Road, Leominster HR6 8NZ, UK.

Droncit (praziquintel): Bayer PLC, Animal Health Business Group, Eastern Way, Bury St Edmunds, Suffolk IP32 7AH, UK.

Aureomycin (chlortetracycline hydrochloride): Cyanamid UK, Animal Health Division, Gosport, Hampshire, UK.

Panacur (fenbendazole): Hoechst-Roussel Vet Ltd., Walton Manor, Walton, Milton Keynes, Buckinghamshire MK7 7AJ, UK.

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The above account is based on an article by Andrew Owen which was published in Dodo 36:51-61 (2000), to which information has been added about the breeding of this species at Jersey Zoo. Andrew is at present in the process of writing guidelines for the Montserrat Oriole and has offered to describe the breeding of this species in a future issue of the magazine.

After six years at Jersey Zoo, he has recently left the Channel Islands and moved to Oxfordshire.

A HISTORY OF THE GENUS *Picathartes* IN CAPTIVITY, 1948-2002

by Marvin L. Jones

The genus *Picathartes* consists of two species both of which live in West Africa. *Picathartes oreas* (Reichenow 1899) (the first of the two to be kept in captivity) is known under a variety of vernacular names: Grey-necked Picathartes, Grey-necked Rockfowl, Blue-fronted Rockfowl, Blaustirn Stelzenkrahe, Blauwkap Picathartes and Red-headed Rockfowl. *P. gymnocephalus* (Temminck 1825) is also known under a variety of vernacular names: White-necked Picathartes, White-necked Rockfowl, White-winged Rockfowl, White-headed Rockfowl, Bald Crow, Yellow-headed Bald Crow, Weissshals Stelzenkrahe, Kaalkopkraai, Witnek Picathartes, Hvidstrubet Kragedrossel.



Picathartes oreas painted by Roland Green

Both species have been exhibited in a number of collections. They were primarily taken as nestlings and hand-reared in Africa and brought to captivity by only a few animal suppliers, who have never written about how they were collected and how they were reared. They have bred in a few of these collections, often successfully. As few were banded (ringed), there are few accurate records of the longevity of the longest surviving birds. Moreover, few of them were sexed, even after death, and few were saved for zoological museums.

The following list has been prepared from reports to the International Species Information System (ISIS). Other data was received from many of the exhibiting collections or was in articles written by zoo staff. All this will be summarized later by my good friend Josef Lindholm.

Also included is census information from the *International Zoo Yearbook* (hereafter abbreviated to *IZY*). The yearly census of rare animals that appeared in this publication was supposed to reflect the totals living in collections as of January 1st of the cited year, however this list in the early years was submitted from January or February through the summer months, and it was often the habit of collections to list specimens which may have arrived or hatched anytime from January 1st until the list was submitted, furthermore it gave only the numbers, not when specimens actually arrived or hatched. Still it is a guide especially for collections which did not submit data to ISIS or failed to answer my enquiries.

* An asterisk indicates specimen is listed by ISIS

Abbreviations: cb = captive hatched cd = cause of death est. = estimated date of hatching wb = wild born

Picathartes oreas

0.0.1 recd 14 Sep 1948 London Zoo

Collected as an adult in the then British Cameroons by Cecil S. Webb, Curator-Collector, later Curator of Mammals and Birds, London Zoo. Webb (1948 & 1953) described how this bird was brought to him having been caught in a snare set to catch a porcupine intended for the cooking pot.

0.0.1 died 28 Dec 1957 London Zoo

By then it was almost blind and unable to fly

*1.1.1 recd 27 Sep 1968 Frankfurt Zoo
wb, est. 1967, from G. van den Brink, Soest
0.1.0 died 3 Sep 1969 Frankfurt Zoo
0.0.1 died 14 Apr 1970 Frankfurt Zoo
1.0.0 died 18 Oct 1971 Frankfurt Zoo

IZY census 1969: Frankfurt Zoo 0.0.3

*1.1.1 recd 2 Jan 1969 Frankfurt Zoo
wb, est. Mar 1968, from Borglum
(Frankfurt incorrectly spelt it Berglum)
0.0.1 died 20 Jun 1969 Frankfurt Zoo
0.1.0 died 20 May 1988 Frankfurt Zoo
1.0.0 died 10 Oct 1973 Frankfurt Zoo

IZY census 1970: Frankfurt Zoo 0.0.4; Walsrode Bird Park 0.0.6;
Wassenaar Zoo 0.0.1.

0.0.1 recd 20 Mar 1970 Wassenaar Zoo
wb, Cameroons, from van den Bijl, Busum darntoomis
0.0.1 died 18 Jun 1974 Wassenaar Zoo

IZY census 1971: Frankfurt Zoo 1.1.1; Walsrode Bird Park 0.0.5;
Wassenaar Zoo 0.0.1.

*1.0.0 hatched 9 Apr 1971 Frankfurt Zoo
1.0.0 died 1 May 1971 Frankfurt Zoo

*1.1.0 hatched 3 Jul 1971 Frankfurt Zoo
1.0.0 died 21 Feb 1982 Frankfurt Zoo
0.1.0 died 31 Jan 1986 Frankfurt Zoo

*0.1.0 hatched 26 Sep 1971 Frankfurt Zoo
0.1.0 died 16 Feb 1973 Frankfurt Zoo
cd infection associated

*0.0.1 hatched 27 Sep 1971 Frankfurt Zoo
0.0.1 died 6 Nov 1971 Frankfurt Zoo
cd environmental or behavioural conditions

IZY census 1972: Frankfurt Zoo 0.1.4 (cb 0.0.3);
Walsrode Bird Park 0.0.5; Wassenaar Zoo 0.0.1

*0.0.1 hatched 9 Sep 1972 Frankfurt Zoo
0.0.1 died 14 Sep 1972 Frankfurt Zoo
cd unknown

IZY census 1973: Frankfurt Zoo 1.1.3 (cb 0.1.2);
Wassenaar Zoo 0.0.1

IZY census 1974: Frankfurt Zoo 1.1.1 (cb 1.0.1);
Walsrode Bird Park 0.0.2; Wassenaar Zoo 0.0.1

*0.0.1 hatched 11 Apr 1974 Frankfurt Zoo
0.0.1 died 15 Apr 1974 Frankfurt Zoo
cd unknown

*0.0.1 hatched 26 May 1974 Frankfurt Zoo
0.0.1 died 27 May 1974 Frankfurt Zoo
cd unknown

*0.0.1 hatched 1 Aug 1974 Frankfurt Zoo
0.0.1 died 9 Aug 1974 Frankfurt Zoo
cd unknown

*0.0.2 hatched 11 Sep 1974 Frankfurt Zoo
0.0.1 died 3 Oct 1974 Frankfurt Zoo
cd infection associated
0.0.1 died 8 Oct 1974 Frankfurt Zoo
cd infection associated

IZY census 1975: Frankfurt Zoo 1.2.0 (cb 1.1.0);
Walsrode Bird Park 0.0.1.

*0.0.1 hatched 30 Jun 1975 Frankfurt Zoo
0.0.1 died 3 Jul 1975 Frankfurt Zoo
cd unknown

*0.0.1 hatched 12 Aug 1975 Frankfurt Zoo
0.0.1 died 19 Aug 1975 Frankfurt Zoo
cd infection associated

- IZY* census 1976: Frankfurt Zoo 1.2.0 (cb 1.1.0).
 *0.0.1 hatched 7 Mar 1976 Frankfurt Zoo
 0.0.1 died 16 Mar 1976 Frankfurt Zoo
 cd unknown
- *0.0.1 hatched 9 Apr 1976 Frankfurt Zoo
 0.0.1 died 17 Apr 1976 Frankfurt Zoo
 cd unknown
- *0.0.1 hatched 10 Apr 1976 Frankfurt Zoo
 0.0.1 died 15 Apr 1976 Frankfurt Zoo
 cd unknown
- *0.0.1 hatched 15 May 1976 Frankfurt Zoo
 0.0.1 died 22 Jun 1976 Frankfurt Zoo
 cd unknown
- *0.0.1 hatched 1 Nov 1976 Frankfurt Zoo
 0.0.1 died 7 Nov 1976 Frankfurt Zoo
 cd unknown
- No *IZY* census 1977; *IZY* census 1978: Frankfurt Zoo 1.2.0 (cb 1.1.0).
 *0.0.1 hatched 4 May 1978 Frankfurt Zoo
 0.0.1 died 9 May 1978 Frankfurt Zoo
 cd environmental or behavioural conditions
- IZY* census 1979: Frankfurt Zoo 1.2.0 (cb 1.1.0).
 *0.0.1 hatched 23 Apr 1979 Frankfurt Zoo
 0.0.1 died 30 Apr 1979 Frankfurt Zoo
 cd unknown
- *1.0.1 hatched 27 Dec 1979 Frankfurt Zoo
 0.0.1 died 6 Apr 1982 Frankfurt Zoo
 cd infection associated
 1.0.0 died 26 Nov 1984 Frankfurt Zoo
 cd infection associated, sold to an institution
- IZY* census 1980: Frankfurt Zoo 1.2.0 (cb 1.1.0).
 *0.1.0 hatched 16 Mar 1980 Frankfurt Zoo
 0.1.0 died 2 Aug 1980 Frankfurt Zoo
 cd unknown
- IZY* census 1981: Frankfurt Zoo 1.2.2 (cb 1.1.2).
IZY census 1982: Frankfurt Zoo 1.2.2 (cb 1.1.2).
 *0.0.1 hatched 12 May 1982 Frankfurt Zoo
 0.0.1 died 12 May 1982 Frankfurt Zoo
 cd unknown
- IZY* census 1983: Frankfurt Zoo (cb 1.2.0).
 *0.0.1 hatched 22 Feb 1983 Frankfurt Zoo
 0.0.1 died 13 Mar 1983 Frankfurt Zoo
 cd environmental or behavioural conditions

- *0.0.2 hatched 19 Apr 1983 Frankfurt Zoo
 0.0.1 died 19 Apr 1983 Frankfurt Zoo
 cd unknown
 0.0.1 died 7 May 1983 Frankfurt Zoo
 cd infection associated
- *0.0.2 hatched 11 Aug 1983 Frankfurt Zoo
 0.0.1 died 13 Aug 1983 Frankfurt Zoo
 cd unknown
 0.0.1 died 20 Aug 1983 Frankfurt Zoo
 cd unknown
- IZY* census 1984: Frankfurt Zoo (cb 1.2.0)
- *0.1.0 hatched 28 Mar 1984 Frankfurt Zoo
Still living at Frankfurt Zoo
- *0.1.1 hatched 18 Jul 1984 Frankfurt Zoo
 0.0.1 died 7 Sep 1985 Frankfurt Zoo
 cd infection associated, sold to an institution
 0.1.0 died 23 Sep 1985 Frankfurt Zoo
 cd infection associated
- IZY* census 1985: Frankfurt Zoo (cb 0.2.3)
IZY census 1986: Frankfurt Zoo (cb 0.2.1)
IZY census 1987: Frankfurt Zoo (cb 1.1.0)
IZY census 1988: Frankfurt Zoo (cb 0.2.0)
IZY census 1989, 1990, 1991 Frankfurt Zoo (cb 0.1)

Picathartes gymnocephalus

- 0.0.1 recd 16 Dec 1954 London Zoo
 Collected as a nestling in Sierra Leone and hand-reared by Alfred Woods, Head Keeper of the Bird House, who was a member of the joint BBC/London Zoo 'Zoo Quest to Sierra Leone'. The expedition which began Sep 1954, was led by Jack Lester (LZ) and David Attenborough (BBC).
- 0.0.1 died 8 Jan 1960 London Zoo
- 0.0.1 recd 20 Apr 1957 London Zoo
 Collected as a nestling in Sierra Leone and hand-reared by Jim Menzies, who presented it to the zoo.
- 0.0.1 died 19 Aug 1957 London Zoo
 cd tuberculosis possibly contracted in West Africa
- 0.0.2 recd 26 Jun 1957 London Zoo
 Collected as nestlings in Ghana and presented to the zoo when still nestlings by M. Horwood.
- 0.0.1 died 3 Jul 1957 London Zoo
 0.0.1 died 4 Jul 1957 London Zoo

TO BE CONTINUED

THE AVICULTURAL MAGAZINE AND ME: A SYMBIOSIS

by Derek Goodwin

Replying to a letter from me with queries about sundry matters, our Membership Secretary, Stewart Pyper, was kind enough to say, or rather write: "...your contributions to the magazine have been monumental over the years." Needless to say I was very pleased by this compliment which I felt ("Vanity, vanity, all is vanity!") was not entirely undeserved, but at the same time I was very conscious that my relationship with our magazine had, if only by a series of coincidences, been symbiotic and probably far more advantageous to me than to the magazine.

Many other ornithologists, some very eminent, have, for reasons I will mention later, been glad to have some of their works published in the *Avicultural Magazine*. For example Jean Delacour, Reg Moreau, Magdalena Heinroth, Konrad Lorenz and my friend Ken Simmons who in February 2002 died tragically after a long crippling illness.

So far as I know though, no one else, except perhaps the magazine's various editors, had their lives so chanced for the better as I did. In August 1945 I returned, as a soldier of 25, from service overseas in Egypt, Libya and Malta and was granted four weeks leave. During this period I visited the Zoological Department of Gamages emporium in London. There I saw on sale some 1920s copies of the *Avicultural Magazine*, including one for January 1929 with an article on the Common Bronzewing Pigeon *Phaps chalcoptera* by Mr T. H. Newman, illustrated with a beautiful and accurate painting of this species by Mr H. Goodchild. I purchased this copy (which I still have) and several others and fell into conversation with the young man who served me with them. To my surprise, he told me that the *Avicultural Magazine* was still being published and gave me the address of its then (and for long after) Hon. Editor, Miss Phyllis Barclay-Smith, who then had rooms at the British Museum (Natural History) in South Kensington. I wrote to her and this led to my becoming a member of The Avicultural Society. I was tempted to become a Life Member, but felt I could not afford the cost of that which, if I remember correctly, was then £10 (about US\$16 at the present exchange rate)!

In June 1946 I was demobbed and began seriously to consider whether to try for some more congenial job than my pre-war one in a mail order business. But I soon ascertained that there were very few jobs in any way connected with birds and wildlife and for those there were a doctorate was essential. However, Miss Barclay-Smith suggested I visit her at the museum when next in London. There she introduced me to Mr J. D. Macdonald, who was then in charge of the Bird Room, as the three-storey department,

each with several individual rooms within it, which then housed the bird collection was called because long before, it had been merely one room, or so I was told.

Mr Macdonald, to my great surprise, offered me a job as temporary assistant. Luckily for me, it was then (but only for a few more years) possible to get on to the permanent staff in due course, if one could satisfy the examining board that one was suitable even if one did not have any paper qualifications. I managed to do so just in time. Of course, working in the Bird Room, I had access to study skins of all the birds in the museum collection, and the superb ornithological library. I also met many interesting ornithologists from all over the world. Some of whom became life-long friends or pen friends.

Needless to say, such employment ideally dove-tailed with my studying, keeping (preferably free-flying), watching and enjoying the beauty of living birds. I was able to combine the fruits of both my employment and my hobby in the six books on birds I have written, four of which were done as part of my official work and written in my working time in the museum.

I often think how different, and worse, my life might have been had I never seen those old copies of the *Avicultural Magazine* in Gamages.

Now to turn to some of the virtues of our magazine, too often overlooked by some bird addicts, including, or perhaps especially some in influential positions in scientific, conservational and legal organisations.

Anyone who has written letters or articles to be (he or she hopes) published in magazines devoted to ornithology (using that term in its widest sense) will know how the editors of such publications (as also those of the newspapers) feel it incumbent on themselves to edit all such offerings by cutting out all that they consider irrelevant which too often includes the author's carefully explained reasons for his or her opposition to any currently politically correct (in ornithological or conservational circles) opinions and any of those anecdotal or humorous asides which so often make pre-1900 copies of the *Ibis*, *Auk*, *J. Orn.* and other such prestigious publications so much more interesting to read and to re-read, than the post-1980 volumes of the same journals.

I have found the *Avicultural Magazine* one of the most fertile sources of information on bird behaviour and very often of items I have not found elsewhere. Even if sometimes one gets exasperated at the lack of detailed description of some activity mentioned.

However, the fact that contributors to our magazine often write in everyday language is more often than not more agreeable to the professional ornithologist as well as more understandable to readers generally. I recall, long ago, when a great friend of mine, now alas, no longer with us, in an article he was about to submit to a scientific journal did not like a line he

had written: "Some Arctic-breeding waders have their escape-reactions set at a high threshold level of response where Man is concerned as a predator." I mildly suggested that he change it to "Some Arctic-breeding waders have little fear of Man". He did, and, to his credit, the editor accepted it.

Because they have been able to have their offerings published in full has, I believe been one reason that many renowned ornithologists as well as less well known but not necessarily less knowledgeable bird addicts have written articles for the *Avicultural Magazine*. Another advantage, which I have realised more fully in my old age, is that although as one gets older one recalls very vividly past events in one's life, one does not recall all of them, especially not minor but still relevant details. Often, referring back to what I wrote in past copies of the *Avicultural Magazine*, I have been able to re-read what I had once written and re-learn facts that I could no longer remember. Similarly I (and others) have written articles for the *Avicultural Magazine* summarising my experience with this or that species including much that many editors of other bird journals would have excised as sentimental or anecdotal irrelevancies but which, I believe and hope are not so regarded by many of my readers.

At least I am in good company as not only are the writings of such rightly revered past naturalists as Darwin and Wallace thus enriched, but so are those of one, Alexander Skutch, whom I regard as one of the greatest field ornithologists and (an unusual combination) one of the greatest and most humane thinkers (and publisher of his thoughts in eminently readable books) whose working life has largely overlapped my own. Though, I hasten to add, his writing abilities and general knowledge are much superior to my own.

Though I do not suppose many of my readers will benefit so much from our magazine as I have, I hope they will also enjoy reading back issues and contributing to future numbers of it.

* * *

AVICULTURAL MAGAZINES BACK ISSUES

A large stock is available including some early issues. Further details are available from: The Membership Secretary, Stewart Pyper, 21 Primrose Hill, Nunney, Frome, Somerset BA11 4NP, UK. Tel:01373 836293 or E-mail: Paul@pboulden.fsnet.co.uk.

THE SOCIETY'S VISIT TO BLACKBROOK ZOOLOGICAL PARK (APRIL 5th 2003)

by Philip Schofield

There has been an animal collection open to the public on the Blackbrook site for a considerable time. Initially Blackbrook Farm, it has undergone various name changes, each one reflecting the current emphasis of the collection. Taken over in 1991 by Diana Holloway (who at the April 5th 2003 Council Meeting was elected a Vice President of the Avicultural Society) and her son Mark Rubery, the collection is now designated Blackbrook Zoological Park. This reflects its present status as a proper zoo, with mammals, reptiles, fish and invertebrates, although birds still greatly outnumber all the other groups on show. This was my first visit - I do not usually venture so far north.

The collection holds some 300 bird species, of which 130 are waterfowl, on the 70 acre (28 hectare) site. This must be one of the most comprehensive collections of waterfowl ever assembled, given that there are in total only 146 species of ducks, geese and swans. For me, the most noteworthy waterfowl at Blackbrook divide easily into two groups. The first of these being the sea ducks, some of which can be difficult to keep in conventional collections, but high on the Staffordshire moors they do well and look as fit as wild birds. The main sea duck lake (8ft (approx.2.4m) deep) is at the highest point on the property. I imagine this enables the occupants to enjoy the same benefits as those of the new penguin enclosure at Whipsnade Wild Animal Park, with the relatively cool and windswept conditions making it difficult for disease organisms to flourish. I counted 20 Long-tailed Ducks, looking as fit as I have ever seen them. The males were calling and their 'song' of four or five syllables was for me evocative of time spent in Iceland. This very un-ducklike sound is difficult to render into words, so if you have not heard it and would like to, try to access a good sound recording. A species which the Wildfowl & Wetlands Trust once described as being too difficult to keep, the Long-tailed Duck seems to thrive under the semi-natural conditions at Blackbrook. The other startling sea duck on show, less dramatic in voice and behaviour, is Steller's Eider, represented by two males. Smaller and different in shape to the other eiders, Steller's is still comparatively little known as an avicultural subject. One could spend many hours at Blackbrook concentrating on the sea duck alone, given that there are also King, Spectacled and Pacific Eiders, Common and Velvet Scoters, Barrow's Goldeneye and Smew. Any one of these would be the talking point of any collection that included them. Admittedly Smew have become relatively cheap and available in recent years, but they still attract attention wherever they are seen.

The second notable category of waterfowl at Blackbrook is what I call the neglected species. These are the ones that do not make it into most collections by virtue of being too similar to something else, not brightly coloured, too aggressive or too subtle for most people. A shining example is the Koloa or Hawaiian Duck. An Hawaiian endemic, between a Mallard and Laysan Teal in appearance, it would benefit from a large captive population as an insurance against catastrophe overtaking the wild population. Unfortunately, most people just do not bother with it. Lacking the engaging tameness of the closely related Laysan Teal, the slightly larger Koloa is rarely kept and dealers tell me they cannot sell them. Several pairs of Hawaiian Duck have their own enclosure at Blackbrook. Perhaps I should put my money where my mouth is and get some! If all aviculturists were as committed to conservation as we say we are, there should be as many Koloas in collections as there are Nene. Coming from the same part of the world, the latter, like the Laysan Teal, sells itself by its tameness and is also visually striking; thus it has in a few decades gone from near extinction to being one of the commoner ornamental waterfowl. Continuing on the theme of Mallard-type ducks, Blackbrook has a nice group of Chinese Spotbills. Passed over by many in favour of the Indian nominate form, they are worth keeping for their deep purple speculum and boldly stripped face markings. Other birds in my neglected species category present in the collection include the American Black Duck (not colourful and can be quarrelsome), Lesser Snow Goose (nowadays usually passed over in favour of the more petite Ross's), Greenland and Pacific White-fronted Geese (almost everybody keeps the Lesser White-front).

A comprehensive collection of geese are displayed. The only absences I noted were the Greater Snow Goose (has this subspecies disappeared from UK collections due to neglect?), Kelp (nobody has ever kept a stock going) and Aleutian Canada. Everything else seemed to be there, even the common Greylag and Atlantic Canada Goose. The black Spur-winged Goose is represented in the collection, as is the enchanting 'musky scented' Magpie Goose. Other unusual species include the Comb Duck and a pair of the impressive, but aggressive Flightless Steamer Duck. It is fashionable in some avicultural circles to decry mutations; I do not subscribe to this, as long as the original wild type of a species is not neglected. Mutations look at their best with the normal form available for comparison. The only mutation waterfowl I noted at Blackbrook were silver Mandarins, in company with normal birds. A large group of Spotted Whistling Ducks bore witness to breeding success, as did three of last year's Whistling Swan cygnets, still with their parents and very much a family group. The Madagascar Teal, established recently in aviculture via Jersey Zoo, also produced young in 2002.

In an account of this kind, it is difficult to avoid lists, and the cranes at Blackbrook make an impressive one: Wattled, Common, East and West African Crowned, Sarus, Demoiselle, Sandhill, White-naped, Stanley and Black-necked - 10 of the world's 14 species. The Black-necked must be the only ones in the UK; now that Whipsnade no longer displays a collection of cranes, this must be the best collection on view in this country.

A good collection of pheasants continues my neglected species theme. Berlioz's Silver Pheasant is on show, subtly different from the commonly seen nominate form, most noticeably in the lacing on the female's breast. Various kalij are represented, as is the once relatively abundant Hume's Pheasant. This and other pheasant species may be building up their numbers slowly after a few difficult years, occasioned by inappropriate transport regulations. It was good to see Green and Sonnerat's Junglefowl as well as the conservation sensitive Edwards' and Vietnamese Pheasants. The latter share a well planted aviary with a small group of Scarlet Ibis. There are also Blue, Brown and White Eared Pheasants, none of them as commonly kept as they should be.

Minor specialisms at Blackbrook are pelicans (small flocks of several species on open lake settings, where they look immaculate and do not smell of fish as they can do in more restricted quarters), ibises (at least five species, of which the Black-faced was on eggs) and storks. Hammerkops laid fertile eggs last year and the only UK-bred Marabou, hatched in 1999 (see *Avicultural Magazine* Vol.106, No.4, pp.182-184), can be seen. White, Painted and Maguari Storks are also on view.

Noticeable by their absence are parrots; outside the pets' corner the only psittacines are a pair of Sun Conures. Parrots are a charismatic group that form the backbone to many collections, so it was nice to see storks and ibises being promoted for a change. Owls are represented by a tethered European Eagle Owl (apparently well socialised to people), Snowy, Hawk, Boobook, White-faced Scops, Great Grey and Ural Owls.

A pair of purpose-built lengthy aviaries house Great Blue and Ross's Turacos, and a full-winged pair of Secretary Birds that used to live at Rode have an aviary here. The enigmatic Guira Cuckoo has been imported recently from South America, and a pair is on view, as is a pair of Australasian Piping Crows.

All the above birds are housed outside. There is plenty of interest indoors as well. The smaller tropical house comprises a single densely planted aviary (viewed from a darkened corridor), which is occupied by Bronze-tailed Peacock Pheasants, Black-chinned Fruit Doves and a Luzon Bleeding Heart. The larger tropical house has aviaries along one side, with Blue and Sheepmaker's Crowned Pigeons among other species. There are reptile units along the opposite side and a long saltwater pool down the middle,

occupied by small tropical sharks and rays. The end opposite the entrance is of glass, looking out on a pool aviary with Hottentot and Madagascar Teal, which were due to be joined by a flock of Carmine Bee-eaters (held in off-exhibit winter quarters) when the weather warmed up.

Mammals are sufficiently prominent to provide enough interest for the non bird-minded visitor. In addition to the almost obligatory Meerkats, there are some spectacular badger-sized Giant Marmots from the eastern Asian steppes, five species of lemur in a purpose-built complex, Crested Porcupines, Alpacas, Guanacos, Llamas, Bennett's and Parma Wallabies, Dwarf Zebu cattle, Capybara and a Brazilian Tapir awaiting a mate. The two last-named species share an enclosure with South American waterfowl.

A brief account like this (I have left a lot out) cannot do justice to this important and well laid out collection. It is even more impressive when one remembers the nearby Hillside Bird Oasis (formerly Hillside Ornamental Fowl) now operates as a private breeding establishment for the Blackbrook collection.

* * *

GENEROUS DONATION

Following a visit to Chestnut Lodge, Cobham, West-Vlaamse Parraket Club of Belgium, made a £70 (just over US\$100) donation to The Avicultural Society. The donation, for which the society is most grateful, was presented to Raymond Sawyer by club President Carlo Mattheeuws.

* * *

LIBRARY GOES ONLINE

You can now search much of the Zoological Society of London library catalogue via the zoo website: www.zsl.org The online catalogue provides details of all the library's journals and more than 12,000 books. Details are available of all books added since 1991 plus all books published before 1860. You can even check if a book is on the shelf or out on loan.

BOOK REVIEWS

PHOTOGRAPHIC GUIDES TO THE BIRDS OF INDIA, SOUTH-EAST ASIA AND INDONESIA

These three guides published recently by Christopher Helm (an imprint of A & C Black Publishers Ltd.) here in the UK are identification guides to a wide selection of the easy-to-see species of these regions and although intended primarily for birdwatchers and tourists, are sure to be of considerable interest to aviculturists.

All three are fairly thick paperbacks that follow more or less the same format: each starts with the usual introductory chapters, which include descriptions of the different habitats within the regions and some of the best places to watch birds; the main part of each guide though is the Systematic Section (i.e. species guide), with two species per page, each species illustrated with one or two colour photos. There is a brief text covering Description, Voice and Habits, and a small distribution map, with the species' range shown clearly in red (breeding) and/or blue (migratory/non-breeding), as well as a written description of the distribution of each species.

A Photographic Guide to the Birds of India including Nepal, Sri Lanka, The Maldives, Pakistan, Bangladesh & Bhutan by Bikram Grewal, Bill Harvey and Otto Pfister (ISBN 0-7136-6403-7), is just over 500 pages long and includes some 800 species and distinct subspecies, illustrated with just over 1,000 colour photos. Many of the species are familiar or once familiar avicultural subjects. The bird trade from India up until 1991, when a total ban was introduced, is touched upon. The authors estimate that between 1970-1976, 13 million birds were exported, mostly munias and parakeets. Hunting, which was at its peak during the time of the British Raj, is also touched upon, using as an example some of the record bags at Bharatpur, where on November 12th 1938, during the visit of H. E. The Viceroy Lord Linlithgow, 3,044 birds were shot in the morning and 1,229 in the afternoon, a total for the day of 4,273 birds.

A Photographic Guide to the Birds of Southeast Asia including the Philippines & Borneo, text and photos by Morten Strange (ISBN 0-7136-6402-9), 398 pages, covers mainland south-east Asia, the Philippines and Borneo, and includes birds of Peninsular Malaysia, Thailand and Indochina, as well as south China, Hong Kong and Taiwan. Six hundred and sixty-eight species are included, illustrated with more than 700 colour photos. *A Photographic Guide to the Birds of Indonesia*, with text and photos by Morten Strange (ISBN 0-7136-6404-5), covers 686 species, illustrated with almost 700 colour photos.

Both contain fascinating collections of photographs. Many are of species

which are known in aviculture, or belong to families that are familiar within aviculture, e. g. the pheasant family, pigeons and doves, parrots, bee-eaters, kingfishers and rollers, hornbills, barbets, pittas, laughingthrushes and munias; others are of species which are rare or unknown in aviculture. A few of the photos are of captive birds, but most were taken in the wild; some were photographed specially, this was especially true of those Indonesian species found only in Nusa Tenggara (or the Lesser Sunda Islands, stretching from Lombok to Tanimbar) and West Papua (formerly known as Irian Jaya).

All three guides are priced £19.99 in the UK. For more information you can visit the A & C Black website: www.acblack.com

Malcolm Ellis

SWAN KEEPER'S HANDBOOK

Swans are fascinating, regal, have a long association with man, and needed a treatise devoted to them. Such a work has now been published...and by a group of authors and photographers that have a long list of credits. The principal author, G. R. Gardner, took over from his father as caretaker of Lakeland's Lake Morton (a lakeside community in northern Florida), where the current flock descended from a pair donated in 1957 by H. M. Queen Elizabeth II. The information gathered, complemented by superb colour photographs, provides an in-depth view of a bird with a long captive history.

In Europe Mute Swans have lived in close proximity to man for perhaps 1,000 years or so. Elsewhere their history is shorter but they are equally popular. This may be because they are such large flighted birds, because they have been regarded as portraying royalty and beauty, and/or because they are such long-lived birds that usually mate for life. Whatever the reason or reasons, the current work will provide the answers to any questions about them that you may have.

The 15 chapters include descriptions of appearance, history in aviculture, captive husbandry, reproduction, plants and flowers suitable for a display pond, and a description of each of the swan species. The information is complemented by photographs that often illustrate the matter being discussed. In Chapter 5 (Diseases and Infections), for example, the authors describe such problems as foot infections which are often associated with poor environment and may appear in the form of "crusted blister-like vesicles or nodules", as illustrated on plate 5.10; bumblefoot is illustrated on plates 5.11 and 5.12; while taking the temperature and blood pressure are illustrated on plates 5.14 and 5.16.

I wholeheartedly recommend that if you are interested in these birds or other aquatic birds that you acquire this book.

Swan Keeper's Handbook: a complete guide to the care of captive swans

by G. R. Gardner, F. F. Funk, S. A. Bolin, R. W. Wilson and S. A. Bolin is published by Krieger Publishing Company, PO. Box 9542, Melbourne, FL 32902, USA. Price £35.95 UK, \$44.50 USA.

Derian A. L. Silva Moraton

GREENFOODS AND SEEDS

In these days, when the emphasis is on style over substance, it is a real pleasure to come across a reference work - *Growing and Collecting Wild and Cultivated Greenfoods and Seeds* by Dave Coles - which avoids this pitfall. Those who are familiar with the author's previous publications such as *Management of Laughing Thrushes in Captivity* (reviewed in the *Avicultural Magazine* Vol. 106, No.3, pp.129-130 (2000)) and the excellent *Culture and Collection of Livefood* will be familiar with the style, namely 44 A4 pages of word-processed text in a limp plastic cover. To dwell on the simple appearance and lack of colour and/or illustrations would be to entirely miss the point. This publication (and each of its predecessors) is all about useful content and this is packed with solid, reliable, practical and usable information which can only be of benefit to serious birdkeepers, especially those who wish to provide the best for their stock and who prefer natural products to the processed additives and supplements which seem to be so much in fashion.

It is divided into sections covering Flowering Plants, Trees and Shrubs, Grasses, Dry Seeds, Greenfood and Sprouting Seeds, Grains and Pulses. There are details on growing, harvesting, storing and feeding, as well as many useful tips and warnings, all presented in a readable, concise style. Although aimed primarily at a UK readership I am sure that most of the principles will apply in other parts of the world, as many of the plants mentioned are not native to the UK anyway. To get the most out of this work it will be useful to have a decent guide to wild plants and there are many titles recommended for further reading at the end of each section.

Until reading this work I was unaware of the potential dangers of pampas grass, turacos' fondness for honeysuckle and the free food available in my garden. Truly a unique publication, it has information to enable you to both save money and improve the health of your birds and should find a place on the bookshelf of all hands-on birdkeepers.

Growing and Collecting Wild and Cultivated Greenfood and Seeds by Dave Coles is priced £10 in the UK and £13 overseas, both prices include p&p. It is available from: Dave Coles, PO. Box 4262, Goring, Reading RG8 9ZQ, UK. Website: www.dcbooks.co.uk

Paul Boulden

CD REVIEW

BRINGING THE FIELD GUIDE TO LIFE

In 1997 Pica Press published *A Field Guide to Birds of The Gambia and Senegal* by Clive Barlow, Tim Wachter and Tony Disley, the definitive field guide to the birds of Senegambia. Excellent though this is, as with other field guides, one's appreciation for the birds it covers has been constrained to a short, though informative text and attractive two-dimensional illustrations.

For the armchair buff the concise text and illustrations help in conveying a good idea of what the birds actually look like - and coupled with better quality nature programmes on television and video these days sometimes even the terrain in which the birds reside can be better appreciated. If anything, the only real area of uncertainty lay with the transliteration of song. For example, on p.189, the Wattled Plover *Vanellus senegallus* is said to have a repeated "ke-weep" alarm call, with other calls based on a rising, shrill and screaming "peep-peep-peep". Now I have never heard a Wattled Plover's calls either in the wild or in captivity, but I have heard those of the Ringed Plover *Charadrius hiaticula*. In *A Field Guide to the Birds of Britain and Europe* by Peterson, Mountford and Hollom (3rd Edition, Collins, 1979), the Ringed Plover's calls are given as "a melodious too-li" or "coo-eep" and the song is said to begin slowly, becoming a trilling repetition of the phase "quitu-weeco".

Obviously, the calls of both species are transliterated by the authors as they believe they heard them, but it is extremely doubtful that I would have transliterated the Ringed Plover's calls I have heard (which would have been the same) identically to that of Peterson et al. (1979). And as familiar as I am with the Ringed Plover's calls but not the Wattled Plover's am I to deduce that both being plovers there is some similarity and, therefore, can imagine how the calls of the Wattled Plover may really sound?

The Ringed Plover is a migrant to Senegal and is listed by Barlow et al. (1997). Interestingly, there (p.186) its calls are described as "a fluty tee-lee or tooeet with an upward inflection". Comparing this with Peterson et al. (1979) it becomes immediately evident that only "too-li" and "tee-li" are similar - but one call is described as "melodious" and the other as "fluty", the latter with an "upward inflection". However, "melodious" and "fluty" are abstract and do not necessarily mean the same! Clearly, the printed word cannot convey the actual calls of the birds, only someone's personal interpretation - with such interpretations varying in almost every different field guide published.

Happily, the problem of transliteration has now been addressed by Clive

Barlow. In collaboration with John Hammick and Pat Sellar, a set of three CDs has been produced comprising of 265 species found in *A Field Guide to Birds of The Gambia and Senegal*. Included are 13 pigeons and doves, 10 cuckoos and coucals, eight bee-eaters, seven kingfishers, nine flycatchers, 12 sunbirds, seven starlings and a wide selection of weavers, bishops and waxbills. A comprehensive collection of all parasitic *Vidua* spp. and their estrildid hosts possibly present in Senegambia are incorporated, including the previously unrecorded Mali Firefinch or Fonio Indigobird *V. camerunensis* and an extended repertoire of the Mali Firefinch *Lagonosticta virata* itself.

So, now bird lovers are able to peruse the field guide (which lists over 660 species) while at the same time listening to the actual calls of almost half the birds of the Senegambia region - and all in the comfort of one's own home! This is the closest one can get to reality without venturing out into the field.

The species order of the CDs follows that in the field guide and an accompanying booklet which provides the corresponding page and plate numbers of the field guide, allows one to easily marry up the bird with the correct call. The only niggle I have, and it is a very minor one, is that one could be forgiven for misidentifying a bird's call on one track with that of the preceding one as only a short silence separates each track. However, if one has a track number display on their CD player this alleviates the problem as it means one can locate a species' call immediately.

The recordings are of an excellent professional quality. At times other species are evident in the background but this in no way distracts from the calls of the targeted species. Indeed, it gives a greater feeling of the surroundings in which the recording was made.

Whether one is seriously interested in ornithology, armchair birding or aviculture, Clive Barlow and his sound recording colleagues have undoubtedly brought the field guide to an entirely new level - one which future authors and their publishers will have to emulate.

The 3-CD set *Bird Song of The Gambia & Senegal - an aid to identification* is available from: Mandarin Productions, Little Merley, Merley House Lane, Wimborne, Dorset BH21 3AA, UK. Price £24.99 per set plus recorded delivery £2.25 or special delivery £5.00 in UK. Add £5.00 for postage to other EU countries or £6.00 for postage to the USA and the rest of the world. Website: www.mandarinproductions.com.uk

Ian Hinze

NEWS & VIEWS

BARBET BRED IN UK AND USA

The Bearded Barbet *Lybius dubius* has been bred at Paradise Wildlife Park, Broxbourne, Herts. Two chicks hatched, one of which died after 10 days, the other was reared successfully by the parents and left the nest on July 1st 2003. In a forthcoming issue of the magazine, Susan Congdon will describe how in 2002, three chicks were raised at Disney's Animal Kingdom, Florida, one was fledged in 2001 and, in 1999, two eggs were artificially incubated and the chicks were hand-reared there.

* * *

FROGMOUTH BRED

A Tawny Frogmouth *Podargus strigoides* has been bred at Paultons Park, near Romsey, Hants., believed to be one of only three UK collections with this species. Removed from the nest when a day old, it was hand-reared, following concern after the second egg that the parents were incubating disappeared. By the time you read this magazine, the bird will be part of a breeding programme at Audubon Zoo, New Orleans, USA.

* * *

WHO WAS PESQUET?

Can you help? Michael Watkins co-author, with Bo Beolens, of *Whose Bird? Men and Women Commemorated in the Common Names of Birds* (A & C Black, 2003) asks, who was Pesquet, after whom Pesquet's Parrot *Psittirichas fulgidus* is named?

* * *

COULD BE TWO SEPARATE SPECIES

Examination of DNA of the Asian and European populations of the Azure-winged Magpie *Cyanopica cyana* has found that there is a relatively deep genetic divergence between the two. It has been recommended that the two populations could be treated as separate species, with the Asian population remaining as *C. cyana* and the European population becoming *C. cooki* with the suggested name of Iberian Magpie.

Fossilised remains said to be more than 44,000 years old, discovered recently in a cave in Gibraltar, rule out the theory that the species was introduced to the Iberian Peninsula in the sixteenth century by Portuguese sailors or brought to Spain by early traders with China and subsequently became established in south-west Europe.

SECRETARY'S SUCCESS WITH SIBIAS

New Hon. Secretary and Treasurer Paul Boulden's pair of Black-headed Sibilias *Heterophasia desgodinsi* has this year successfully reared four young, having failed to rear any of the seven chicks hatched last year. The pair occupy the same 12ft x 6ft x 7ft (approx. 3.6m x 1.8m x 2.1m) aviary as last year but without the other occupants, pairs of Pekin Robins *Leiothrix lutea*, Chinese Hawfinches *Coccothraustes migratorius*, Crested Bronzewing Pigeons *Ocyphaps lophotes* and a California Quail *Lophortyx californica* which, although no antagonism had been noticed, are now housed elsewhere. From the first nest this year a single chick was reared, with a further three being reared from the second nest. Every chick hatched was reared to maturity. The chick from the first nest was left with the adults whilst the second brood of young was being reared. Paul puts the reason for his success this year down to the lack of competition for livefood - large quantities of waxworms were provided every two hours - and improved weather.

* * *

UPDATED BREEDING REGISTER

Samples from Dave Coles' eagerly awaited updated *First Breeding Records For Birds Reared To Independence Under Controlled Conditions In The United Kingdom*, which now contains some 2,000 entries, can be viewed on his new website: www.dcbooks.co.uk. Each sample page has an update page in order to keep the information as current as possible. Copies of the above publication (price £10 in UK, £13 overseas, including p & p) can be ordered through the website, as can copies of his other publications: *The Management of Laughing Thrushes in Captivity*; *The Management of Pekin Robin and Silver-eared Mesia in Captivity*; *Cultivating and Collecting Livefood*; *Growing and Collecting Wild and Cultivated Greenfoods and Seeds*.

* * *

PARENT-REARED TOCO TOUCANS

Here in the UK this year, at least five Toco Toucans *Ramphastos toco* have been successfully parent-reared. Two were raised at Leeds Castle aviaries, near Maidstone, Kent, and three at London Zoo. The latter emerged in late July, after an incubation period of 17-18 days and a period of 50 days within the confines of the nest. Black-necked Aracaris *Pteroglossus aracari* have successfully reared two young at London Zoo, Abdim's Storks *Ciconia abdimii* have bred again after a period of inactivity and immediately prior to this magazine going to the printer, Sun Bitterns *Eurypyga helias* had just hatched a chick. Fifty-two Whipsnade-bred Corncrakes *Crex crex* were released in Cambridgeshire.

SUCCESS WITH GREEN ARACARI

Avicultural Society member Chris Iles has achieved the UK's first breeding of the Green Aracari *Pteroglossus viridis*. His adult pair which he bought last year, reared five chicks to independence from two clutches. More about Chris's achievements - this year he has also bred the Rufous Laughingthrush *Garrulax poecilorhynchus* and Azure-winged Magpie *Cyanopica cyana* - can be found on his website: www.birdtrek.co.uk

* * *

DESERT SUCCESSES

In *International Zoo News* Vol.50, No.5, pp.276-279 (2003), Simon Bruslund Jensen and Sven Hammer describe how in 2002 chicks of both the Greater Bird of Paradise *Paradisaea apoda* and King Bird of Paradise *Cicinnurus regius* were successfully hand-reared in the bird nursery of Al Wabra Wildlife Preservation, owned by Sheikh Saoud Bin Mohammed Bin Ali Al Thani, in Qatar. Much new data was collected and will be included in articles currently in preparation, which may function as protocols for the artificial rearing of these two species, which require significantly different husbandry.

Al Wabra Wildlife Preservation also achieved the first ever captive breeding of the Flamed Bowerbird *Sericulus aureus ardens*. The single egg was artificially incubated and the chick, which was covered in silvery-grey down, was hand-reared.

* * *

CONCERN FOR ABBOTT'S STARLING

The African Bird Club Conservation Fund has given £720 (approx. US\$ 1,000) to Nickson Otieno of the National Museums of Kenya Ornithology Department to survey the population size and density of Abbott's Starling *Pholia (Cinnyricinclus) femoralis* in the Kikuyu Escarpment Forest Reserve, and to identify the species' habitat preferences and breeding requirements. It is also hoped to determine the patterns and intensity of logging in the forest, and the overall effect of this on the starling population.

Abbott's Starling is a little-known, rare East African endemic that is restricted to the canopy of highland forest at altitudes of 1,800m-2,600m (approx. 5,900ft-8,500ft) in central Kenya and north-eastern Tanzania. Its tiny population is thought to be declining throughout its range, due mainly to human activities that have led to the loss and degradation of much of its habitat. In the same issue of the *Bulletin* of the African Bird Club Vol.10, No.2, pp. 125-126, R. J. Dowsett, P.S.M. Berry and D. Foot report the unexpected discovery of Sharpe's Starling *Cinnyricinclus (Pholia) sharpii* in north-eastern Zambia. It is an extension of its range southwards.

LAKE BOGORIA WORKSHOP

A workshop on Ecosystem Health, an introduction to this new discipline which links ecology with medicine, was held in July at Lake Bogoria, Kenya. It was the first of a number to be funded by the Darwin Initiative, part of the UK's response to the Convention on Biodiversity. The workshop was organised by Dr David Harper and co-tutor Prof. John E. Cooper. Lectures were also given by John's wife Margaret, a lawyer with extensive experience of legislation relating to conservation, who along with David's wife Maureen, a teacher, also participated in educational extension work in local schools.

In keeping with the aim of transferring knowledge and technology from the UK to Kenya, all 29 workshop participants were Kenyans, from a wide range of backgrounds. There were ecologists, veterinarians, museum personnel, students and staff from Lake Bogoria and other protected areas. Robert Llewellyn-Smith, African Programme Manager, Earthwatch Institute (Europe), which administers the Darwin Initiative for the British Government, was also actively involved in the workshop.

They heard lectures and participated in discussions regarding the interactions between natural systems and human activity. The aim being to seek valid parameters and measures of the health of ecosystems. The emphasis was on aquatic environments, with in this instance particular emphasis on Lake Bogoria. The Lesser Flamingo *Phoeniconaias minor* provided a focus: there appears to have been a dramatic increase in mortality of this species in recent years and this may be an indication of changing ecosystems. The participants were taught specialised techniques for the pathological examination of flamingos and protocols were drawn up to assist future researchers. They also looked at aquatic ecosystems, both alkaline (soda) lake and freshwater, and were instructed in methods of assessing the health of these, by, for example, sampling and counting invertebrates.

The workshop proved very successful and represented a landmark in the development of ecosystem health as a bona fide discipline. It offered young Kenyans the opportunity to learn how to tackle the question of reconciling conservation of biodiversity with increasing human activity in a challenging environment. The fact that everyone participating in the workshop stayed in tents or in a local inn, meant they were able to build links with the local community whose history, traditions and future are intimately interwoven with Lake Bogoria, its flamingos, its hot springs and its magnificent scenery.

Further information about the workshop and plans for future activities, funded by the Darwin Initiative, are available from: Dr David Harper, Senior Lecturer in Ecology, Department of Biology, University of Leicester LE1 7RH, UK. E-mail: dmh@le.ac.uk or Prof. John E. Cooper, School of Veterinary Medicine, Faculty of Medical Sciences, The University of the West Indies, St. Augustine, Trinidad and Tobago. E-mail: NGAGI@vetaid.net



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